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ORIGINAL

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December 16, 2015

Marlene H. Dortch, Esq.
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, DC 20554
ATTN: Media Bureau, Audio Division

Re: Request for Extension of Experimental Authorization
Georgia Public Telecommunications Commission
NCE Station WJSP-FM, Warm Springs, GA (Fac. ID 23927)
FCC File No. 20130617ACS

Dear Ms. Dortch:

On behalf of Georgia Public Telecommunications Commission ("GPTC"), licensee of noncommercial educational radio station WJSP-FM, Warm Springs, Georgia, we respectfully request an initial twelve (12) month extension, up to and including January 23, 2017, for the experimental authorization previously granted to allow testing of hybrid digital FM in-band on-channel ("IBOC") operation with asymmetrical power levels in the digital sidebands. This request is submitted pursuant to Section 5.203, *et. seq.*, of the FCC's Rules, 47 C.F.R. §5.203.

GPTC originally applied in June 2013 for this experimental authorization, in FCC File No. 20130617ACS. The FCC granted the experimental authorization by letter dated January 23, 2015 (copy enclosed), and the authorization is currently due to expire on January 23, 2016. In connection with this request for extension of the experimental authorization, GPTC provides the enclosed interim report detailing progress, methodology employed and the results obtained in connection with WJSP-FM's authorized IBOC operation with asymmetrical power levels in the digital sidebands.

GPTC respectfully submits that the public interest would be served by the requested extension for WJSP-FM's continued experimental authorization to obtain additional information and experience with respect to IBOC operation by FM stations with asymmetrical power levels in the digital sidebands. Should any questions arise concerning this matter, please contact this office.

Sincerely,

Barry Persh

Barry S. Persh

Enclosures
cc: Susan N. Crawford, FCC (Susan.Crawford@fcc.gov)

FEDERAL COMMUNICATIONS COMMISSION
445 12th STREET, SW
WASHINGTON, DC 20554

MEDIA BUREAU
AUDIO DIVISION
APPLICATION STATUS: (202) 418-2730
HOME PAGE: www.fcc.gov/mb/audio/

PROCESSING ENGINEER: Susan N. Crawford
TELEPHONE: (202) 418-2754
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INTERNET ADDRESS: Susan.Crawford@fcc.gov

January 23, 2015

William T. Godfrey, Jr.
Kessler and Gehman Associates, Inc.
507 NW 60th Street
Suite C
Gainesville, FL 32607

Re: WJSP-FM, Warm Springs, Georgia
Georgia Public Telecommunications Commission
Facility ID No. 23927
File No. 20130617ACS

Request for Experimental Authority

Dear Mr. Godfrey:

The staff has under consideration the June 17, 2013, request for experimental authority, as amended July 8, 2014, submitted on behalf of Georgia Public Telecommunications Commission ("GPTC"), licensee of noncommercial educational FM Station WJSP-FM, Warm Springs, Georgia,[1] to permit Station WJSP-FM to conduct testing of hybrid digital FM in-band on-channel ("IBOC") operation with asymmetric power levels in the digital sidebands. The experimental authority is requested pursuant to Section 5.203 of the Commission's Rules.[2]

The request states that GPTC is seeking experimental authority to operate Station WJSP-FM with lower sideband ("LSB") digital effective radiated power ("ERP") of -10 dBc[3] and upper sideband ("USB") digital ERP of -14 dBc. In support of its request, GPTC submitted an engineering study showing that the proposed operation complies fully with the contour

[1] File Number BLED-20131101AGM.

[2] 47 C.F.R. § 5.203 (*"Section 5.203"*).

[3] Decibels relative to analog carrier.

nonoverlap requirements of the Media Bureau's *Order* adopted January 27, 2010, in MM Docket No. 99-325[4] for operation with -10 dBc LSB digital ERP.

Our review indicates that the proposed Station WJSP-FM operation complies with the contour nonoverlap and other technical requirements of the *Order*[5] and the request for experimental authority meets the requirements for experimental operations set forth in Section 5.203. Accordingly, the request is HEREBY GRANTED. Station WJSP-FM may operate with increased digital ERP as follows:

Analog ERP:	100 kilowatts ("kW")
Digital LSB ERP:	10 kW
Digital USB ERP:	4.0 kW.

This experimental authority expires on **January 23, 2016**. This authority is specifically conditioned on the lack of objectionable interference. A report detailing the methodology employed and the results obtained must be submitted within 90 days following the conclusion of the experimental operation. Any request for extension of this experimental authority should be filed at least 30 days prior to the expiration date of the authority. Additionally, an extension request must include an interim version of the aforementioned report that details the progress of the experimental operation as of the filing date of the request.

Sincerely,

Susan N. Crawford
Audio Division
Media Bureau

cc: Georgia Public Telecommunications Commission
Barry Persh, Esq.

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[4] *See Digital Audio Broadcasting Systems And Their Impact on the Terrestrial Radio Broadcast Service,* Order, 25 FCC Rcd 1182 (2010) ("*Order*").

[5] *Id.*

WJSP-FM Before & After Measurements GPB Media

WJSP-FM Station Configurations

BEFORE: This is the WJSP operation that was licensed by the FCC in 2008. The facilities were 88.1 MHz with an ERP of 42 kW (TPO 9.7 kW plus 1% HD) using Dielectric omnidirectional transmitting antenna side mounted on the Warm Springs tower at 930 feet above ground level.

AFTER: This is the WJSP operation authorized by FCC construction permit BPED-20121010AAI that was granted on November 15, 2012 and licensed on November 26, 2013. The facilities are 88.1 MHz with an ERP of 100 kW (TPO 24.1 kW plus 10% HD lower sideband and 6% HD upper sideband) using an ERI directional transmitting antenna mounted on top of the Warm Springs tower at a height of 1,075 feet above ground level.

General Conditions

The Before and After field strength measurements were performed by Bob Gehman and Jeff Gehman of Kessler and Gehman Associates, Inc. The After measurements were made first because WJSP-FM was already operating in the After mode and so we could start the measurement campaign when we arrived in the area. We started the After campaign near Macon at the intersection of I-475 and US-80, headed west to Columbus, then north to Atlanta. We measured the Atlanta area, then headed south on I-75 toward Macon to the point of beginning. We then asked the chief engineer of WJSP to change the facilities back to the "Before" mode and commenced retracing the exact path. The "Before" measurements continued heading north to Atlanta and the campaign was completed near Macon, at which time we notified the chief engineer that he could switch to the After mode. The temperatures varied between 55-70 degrees and the weather was overcast to light rain. Field strength measurements were made using an

Audemat FM Navigator 10/100 with GPS. We also listened to WJSP continuously on the radio that was in our rental car; a 2013 Mazda 6 with an HD radio. Bob Gehman made approximately 400 notations on maps at points along the route, Before and After, to indicate the quality of the signal received on the Mazda HD radio.

WJSP Qualitative Results

We prepared two sets of maps comparing the qualitative results (See Exhibits 1-4). One set of maps showed the entire measurement area (See Exhibits 1-2) and the other set of maps is zoomed in to Atlanta (See Exhibits 3-4).

The maps are based solely on Bob's listening to the Mazda HD car radio as Jeff drove the car while we made the before and after field strength measurements. Bob noted four different quality levels for both WJSP configurations and each was shown on a map by a different color block as follows:

RED – **HD**. Perfect audio and exceptional stereo separation. Digital, CD quality. Analog FM was also generally very good at points with an HD rating.

ORANGE – **Normal FM**. Occasional noise, but generally good analog FM reception. The fidelity was not as good as HD.

YELLOW – **Noisy FM**. Reception was Noisy, but I would be willing to listen to music and I could understand voice (news, talk, announcements, etc.), although I wish it would be better. I would listen if the content was important to me.

BEIGE – **Not Listenable**. There was so much noise that I could not understand complete sentences and music was not worth listening to.

WJSP Quantitative Results

We prepared a map based on Google Earth that showed the areas where the After signal strength is stronger than the Before signal strength, which was depicted by hexagons shaded in colors of white to red. Brighter red represents a larger increase in

signal strength. This map also showed the areas where the After signal is weaker than the Before signal, which is depicted by hexagons shaded on colors of white to blue. Bolder blues indicate a greater reduction in signal level. Each hexagon is 1 kilometer and the colors are based on a comparison of the average of all points within each 1 kilometer hexagon that were measured After the WJSP increase in power and height compared to the average of all points within the hexagon that were measured Before the WJSP increase in power and height.

STATISTICS BEFORE:

76 points rated HD with a median value of 41 dBu

98 points rated Normal FM with a median value of 33 dBu

80 points rated Noisy FM with a median value of 33 dBu

STATISTICS AFTER: [1]

195 points rated HD with a median value of 36 dBu

76 points rated Normal FM with a median value of 28 dBu

32 points rated Noisy FM with a median value of 21 dBu

Conclusions and Recommendations

Conclusions:

- The number of points that are included in our Before and After quality ratings, which were rated "Normal FM" (generally good reception) and "HD" (CD quality digital and very good FM), increased from 174 Before to 271 After, an increase of 56%.

- We discovered that the signal strength value adequate for FM Stereo reception ranged from 28 to 33 dBu, which is close to the value of 32 dBu included in the ITU Recommendation.[2]

[1] The Before mode also had 114 points rated Not Listenable and the After mode had 12 points rated Not Listenable. However, the After mode has 53 fewer total Qualitative points than the Before mode. We will add these 53 points on our next trip to Atlanta, but even if all 53 points are assumed to be the worst-case "Not Listenable", the overall results will not be significantly different.

- The increase in HD / IBOC power has made a significant impact on HD reception. HD radio is essentially free of the multipath noise that is found with analog FM stereo and many more locations can now receive HD.

- We also discovered that the signal strength value adequate for HD reception ranged from 36 to 41 dBu. This relates favorably to measurements made by Ibiquity and USA Digital, which found the range to be 35 to 50 dBu.[3]

- The field strength value alone is not sufficient to declare the analog FM signal to be clear audio or noisy. This is apparently due to most noise being caused by multipath, which can occur even with relatively strong signal levels.

- Parts of the WJSP-FM service area are affected by interference from other stations. One such station that overloaded our car radio and also caused the measurements to be very high was WREK, Atlanta, 91.1 MHz, ERP 100 kW at a height of 273 feet above ground, owned by Georgia Tech. Therefore the results of the WJSP-FM measurements in the area of WREK are meaningless.

Recommendations:

- Wheatstone claims to include capabilities within its signal processor that will minimize multipath interference. We recommend that GPB contact their Wheatstone sales representative and attempt to borrow a signal processor from Wheatstone to determine whether the reduction in FM stereo multipath interference is significant to justify the purchase of a Wheatstone processor.

- Every high-powered FM station has a so-called blanketing contour within which reception of other FM stations is difficult or impossible due to the strong signal

[2] This is lower than the value of 52 dBu we (KGA) have been using for predicting GPB radio station coverage with Longley Rice propagation algorithm. A change to 32 dBu would show more coverage.
[3] In a 1999 USA Digital FCC filing they stated that 45 dBu was the usual signal strength for blend to analog, but there could be some reception of the digital signal as low as 35 dBu. In 2001 iBiquity field tested 8 FM stations and concluded that "In all cases digital coverage extended to 45-50 dBu."

radiated near the high-power transmitter site. We discovered this near WREK, where the WREK signal made reception of WJSP-FM impossible. FM stations are also required by the FCC to reduce their signal on channels outside of their own channel. We recommend that GPB measure the WREK signal with a spectrum analyzer to ensure that WREK is complying with the FCC out-of-band emission requirements.

Robert Gehman, Jr., P.E.
December 7, 2015

EXHIBIT 1 – BEFORE MAP (ENTIRE AREA)

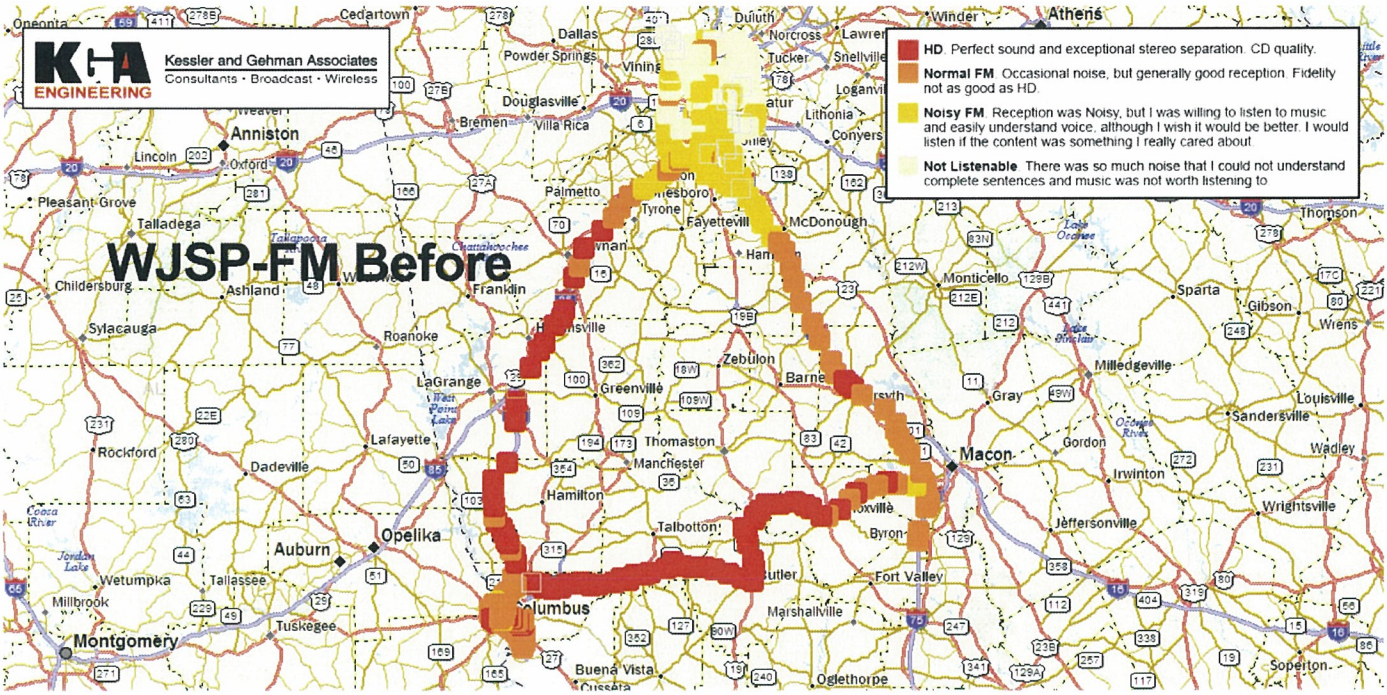

EXHIBIT 2 – AFTER MAP (ENTIRE AREA)

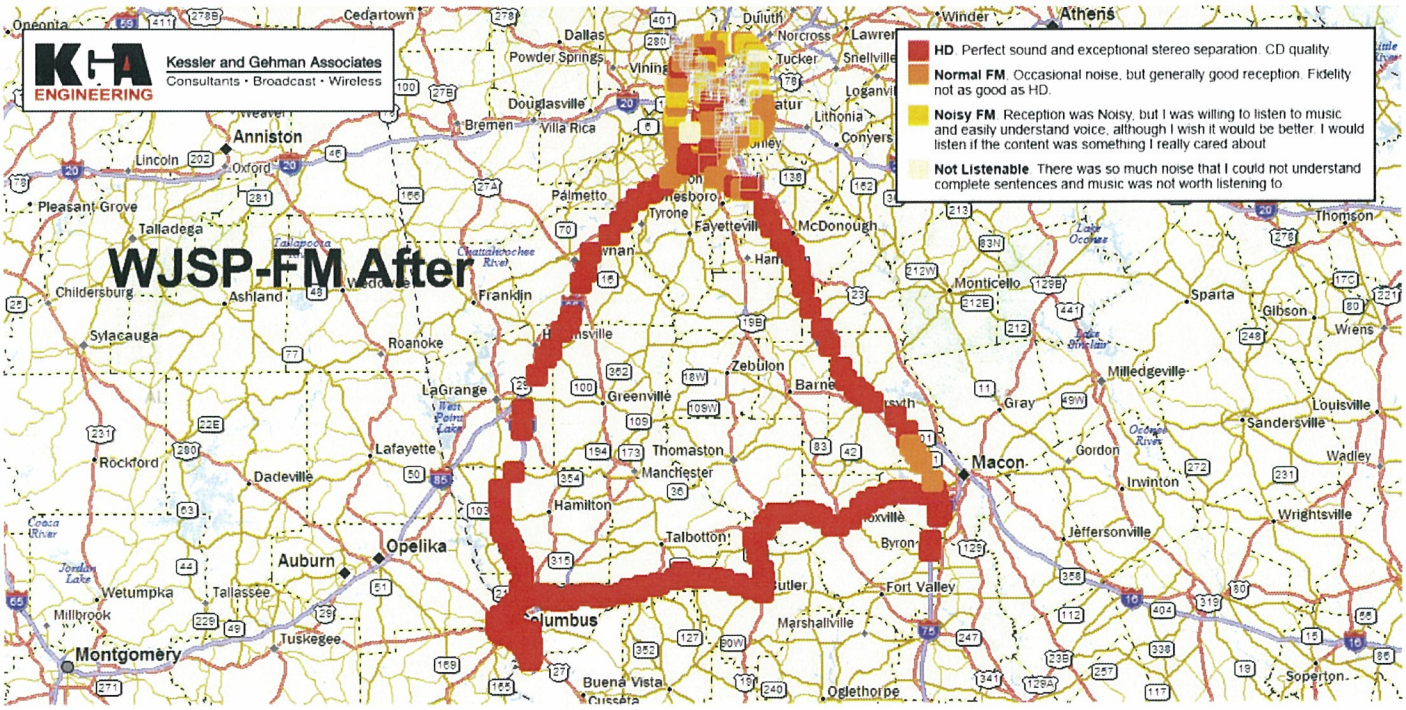

EXHIBIT 3 – BEFORE MAP (ATLANTA AREA)

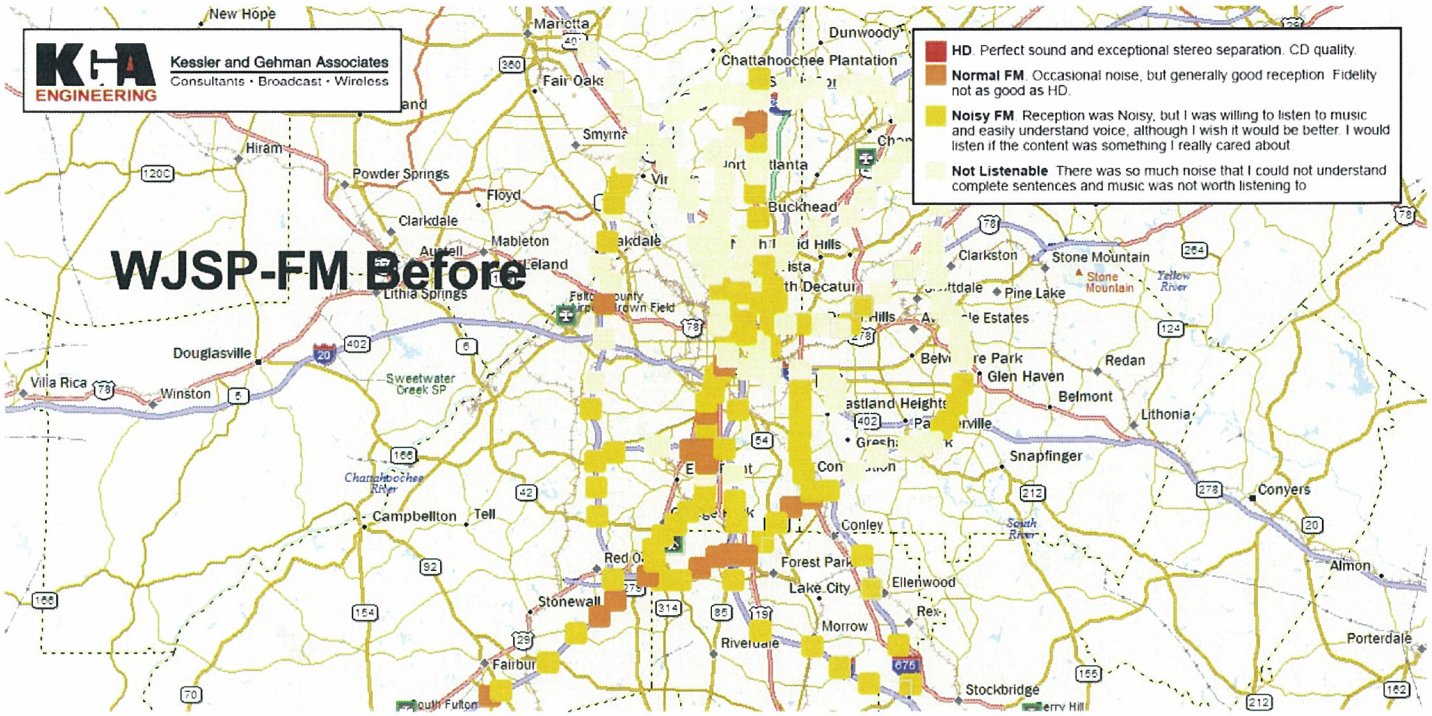

EXHIBIT 4 – AFTER MAP (ATLANTA AREA)